

Acquired Immune Deficiency Syndrome (AIDS)

Definition:

It is a cell deficiency caused by human immunodeficiency virus (HIV) that predisposes to severe opportunistic infection & neoplasm.

It is better to call *it immuno dysregulation* rather than *immunodeficiency* since it is in fact an alteration in T_4/T_8 ratio (normal 2).

Immune deficiency characterized by:

- 1- $T_4/T_8 = 0.5$
- 2- Lymphopenia.
- 3- ↓ Natural Killer cells (NK).
- 4- Diminished activity to antigen.
- 5- Reactive immunoglobulin (but not-neutralizing).
- 6- ↓ Platelets “thrombocytopenia”. (due to hypersplenism)

Etiology:

Type:	RNA, has reverse transcriptase enzyme:
Target cell:	T4, monocytes, macrophages, dendritic cell and non neural brain cells.
Isolation of virus:	All body fluids.
Transmission:	Parental, sexual, perinatal.
Viral activation.	CMV, HSV6, HSV8.
Vaccination:	No vaccination.

Epidemiology:

- Homosexual.
- I.V. drug abuse.
- Blood transfusion.
- Bisexual.
- perinatal HIV of babies.
- Hemophilic person.
- Heterosexual.

Transmission:

Although the virus has been isolated from all body fluids only blood, semen, & vaginal secretions are blamed for transmission.

Diagnosis:

Person infected with HIV develops antibodies against the virus within 6-12 weeks after infection but it may take up to 6 months.

A. Antibody detection:

I- ELSA (enzyme linked immune sorbent assay).

II- Southern blot test.

III- Other fundings.

- 1- CD4 count normal 500/mm³ if below that investigate.
- 2- CD4/CD8 ratio normal = 2(AIDS = 0.5).
- 3- Glycoprotein 24 (found in the core) used in early AIDS detection.
- 4- Antibody against glycoprotein 24.
- 5- Glycoprotein 160 (found in envelop) used for preparing vaccine.
- 6- Delayed hypersensitivity reaction.

B. Antigen detection: polymerase chain reaction (PCR).

Clinical manifestations:

- HIV patients show a wide rang of the disease that varies from asymptomatic to severe immunodeficiency. Incubation period may extent up to ten years.

- Mortality rate is within 3 years after diagnosis of AIDS.
- **Tow classification system are known:**
 - 1- Center of disease control (CDC) system.
 - 2- Walter Reed staging system (more precise).

1- CDC systems

Group I acute infection:

- Mononucleosis- like syndrome: fever, rash, lymphadenopathy.

Group II asymptomatic HIV infection:

- Individual may remain asymptomatic for months or years and can transmit infection.

Group III persistent generalized lymphadenopathy. Last for 3 months.

Group IV HIV associated disease:

1- Constitutional disease: “wasting syndrome”

- Fever (> one month)
- Diarrhea (> one month)
- Weight loss (> 10% of base line)

2- Neurological disease:

- Due to neoplasm or infection.

3- Secondary infection:

- Candidiasis,.....

4- Secondary neoplasm:

- Kaposi's sarcoma.
- Primary lymphoma of brain.
- Non Hodgkin' lymphoma.

2- Walter Reed classification

(WR) According to clinical & Immunological criteria

WRO: No detectable Ab & Ag.

WR1: detectable Ab & Ag.

WR2: Lymphadenopathy.....

WR3: Fall in T₄ level (400/mm³).

WR4: Impaired cell mediated immunity.

WR5: Thrush.

WR6: Other opportunistic infection.

Oral manifestation:

1- Candidal infection various clinical forms were reported including:

- Erythematous: it appears as localized punctate red lesion or diffused erythema commonly on palate.
- Candidal leukoplakia.
- Chronic pseudomembranous candidosis.
- Angular cheilitis.
- *Treatment: Ketoconazole.*

2- Hairy Leukoplakia:

- It is white keratotic lesion on the lateral sides of tongue.
- EBV had been blamed to the causative agent.
- *Treatment: acyclovir.*

3- Kaposi's sarcoma: (due to HSV8 infection)

- It is a multifocal neoplasm, characterized by proliferation of blood vessels.
- Site: head, neck, tip of nose & intra- orally.

- The palate is commonly involved. Smooth, red raised lesions are distributed over the oral mucous membrane that tends to be nodular.
- *Treatment: cryosurgery, sclerosing agent, chemotherapy & radiation.*

4- HIV triad:

- a. Gingivitis: Linear marginal erythema with spontaneous bleeding.
 - b. periodontitis: Bone loss progresses rapidly around the tooth. (No periodontal pockets.)
 - c. Acute necrotizing ulcerative gingivitis: necrosis extends deeply resulting.
- *Treatment: Metronidazole & Iodine, povidone mouth wash.*

Other manifestations of AIDS are less commonly seen such as:

- Cervical lymphadenopathy.
- Aphthous ulcer: persistent major like ulcers.
- Infection: Herpes simplex, herpes zoster, viral warts.
- Malignancy: squamous cell carcinoma.

Treatment of AIDS:

Combined medical treatment of two antiviral drugs are recommended and this include.

a- Interferon.

b- Zidovudine.

Infection control (Hepatitis & AIDS)

1- Those instrument are considered as source of infection:

- Needles.
- Sharp instruments: may tear the gloves.
- Aerosols.

2- Barrier techniques should be carried on by:

- Wearing masks.
- Gown.
- Eye shield.
- Double gloves.

A- *Avoid holding chemicals or methacrylate by gloves as it might increase its permeability.*

B- *Avoid latex gloves as it may induce delayed allergic reaction rendering the skin easily penetrated by the virus.*

3- Cleaning disinfection & sterilization of instruments.

a. Cleaning:

- Ultrasonic cleaning.
- Cleaning with brush, detergent under running hot water while wearing heavy utility gloves and eye glasses.

B- Disinfection: “By any of these chemicals”

- Chlorine derivatives.
- Chlorohexidine gluconate.
- Gluterabledehyde 2%
- Iodine (iodoform spray)

N.B. Disinfection will not kill spores. In order to perform sterilization of the instruments, it should be placed for 10 hrs in 2% gluteraldehyde.

C-Sterilization: “Kill all microorganisms and even spores”

- 1- Steam autoclave: for 20 min at 120°C
- 2- Dry heat oven: for
 - a- 120 min at 160°C
 - b- 60 min at 170 °C
 - c- 30 min at 180 °C
- 3- Rapid heat transfer: “glass bead sterilizer” for 6 min at 190°C
- 4- Unsaturated chemical vapour: for 20 min at 127°C

General principles;

- 1- HBV vaccine to the dentist is a must.
- 2- Proper medical history of the patient.
- 3- Adequate distance between patient and dentist.
- 4- Less aerosol use.
- 5- Less gauge needle (30) so less amount of inoculation.
- 6- One hand technique during anesthesia.
- 7- Recapper for the needle.
- 8- Control sharp instruments “scalars” by wrist and not elbow movement.
- 9- Avoid holding chart, telephone during work.
- 10- Use puncture resistant and labeled waste containers.
- 11- Proper wrapping and sealing for sterilized stored instruments.
- 12- Use disposable instrument as much as you can.

Sterilization of hand pieces & hands of ultrasonic:

- 1- Clean with running water.
- 2- Lubricate.
- 3- Sterilize according to manufacture’s instructions.
- 4- Lubricated before storage.

Sterilization of rubber and plastic item:

- 1- Scrub it under running hot water and detergent.
- 2- Dry.
- 3- Immerse in disinfectant for 10 hours.
- 4- Wash and dry.

Care of laboratory material:

- All materials received from dentist should be clean and disinfected “use silicone base impression material” to be immersed in 2% glutaraldehyde for 10 hours without dimensional changes.
- Teeth should be cleaned, scaled and stored in hypochlorite (1/10) “household bleach” before submitted to dental students for cavity preparation, crown preparation or endodontic treatment.

Treatment of dental problem in AIDS patients:-

According to the American Academy of Oral Medicine

as with all patients, the dentist should:-

- 1- recommend treatment,
- 2- present alternative treatments (if any),
- 3- discuss the probable benefits, limitations and risk associated with treatment.
- 4- Any treatment performed should be with the concurrence of the patient and the dentist.
- 5- Poor patient prognosis is generally not justification for denying the patient a viable treatment option.

When dental treatment is indicated:-

decisions regarding the appropriateness of ongoing and long-term dental care of patients with HIV infection should take into account the patient's general medical status, and should not be based solely on HIV status.

The immunocompetent, asymptomatic HIV-infected individual usually does not require any special consideration when planning, and in the provision of, dental treatment.

As the infection advances to AIDS, laboratory test evaluating the progression of HIVD may become important in determining an appropriate treatment plan.

Patients with CD4+lymphocyte counts above 200cells/mm³ usually have their immunologic status assessed at least every 6 months by their physician,

Those patients with CD4+lymphocyte counts below 200 cells/mm³ usually have appropriate test preformed at least every three months. It is important to

consider general trends in CD4+lymphocyte counts and other laboratory values, rather than any single value, as counts may vary considerably even on a daily basis.

The recommendations below should only be used as general guidelines. Each patient should be evaluated on a case by case basis. When there is a requirement for urgent dental care, a degree of flexibility may be necessary with the critical values outlined below.

1- PROCEDURES LIKELY TO RESULT IN BLEEDING AND BACTEREMIA:

Surgical procedures or instrumentation involving mucosal surfaces or contaminated tissue are commonly associated with transient bacteremia. However, such procedures have not been associated with a higher incidence of symptomatic bacteremia in HIV-infected patients. Therefore, HIV infection itself is not a contraindication to procedures likely to cause bleeding. Nevertheless, due to the multiple systemic effects of HIV infection and the evolving nature of the disease, the patient's medical history may have to be updated prior to each dental encounter in order to assess the need for antibiotic prophylaxis/coverage, and the possibility of anemia and abnormal bleeding tendencies.

2- ANTIBIOTIC PROPHYLAXIS/COVERAGE:

Persons with AIDS may be taking a number of systemic medications, many of which have the potential for interaction with agents prescribed by the dentist. Furthermore, individuals with AIDS, often develop allergies to a variety of medications. Judicious use of systemic drugs, based on a thorough knowledge of the patient's medical history, is therefore recommended.

3- ANTIBIOTIC PROPHYLAXIS TO PREVENT BACTERIAL ENDOCARDITIS:

There are no special considerations for the HIV-infected patient. When indicated by medical history, antibiotics to prevent bacterial endocarditis should be prescribed according to the guidelines set forth by the American Heart Association, as adopted by the Association.

4- ANTIBIOTIC COVERAGE AND THE HIV-INFECTED PATIENT:

For the HIV-infected patient, there are no data supporting the need for routine antibiotic coverage to prevent bacteremia or septicemia arising from dental procedures. Indeed, persons with advanced HIVD have shown a higher incidence of allergic reactions to antibiotics, thus judicious use of antibiotics may be important.

Indications for antibiotic coverage should not be based solely on a patient's HIV status, and should not be based on CD4+lymphocyte counts alone. However, a CD4+lymphocyte count of less than 200 cells/mm³ may indicate the need for a thorough review of the patient's medical history prior to initiating procedures likely to cause bleeding and bacteremia.

Antibiotic coverage, prior to procedures likely to cause bleeding and bacteremia, is recommended for the immunocompromised HIV-infected patient when the neutrophil count drops below 500 cells/mm³ (neutropenia). Patients at this advanced stage of disease may already be taking antibiotics to prevent opportunistic infection, therefore, additional medications may not always be required. However, when antibiotic coverage is indicated, regimens similar to those for the prevention of bacterial endocarditis are considered effective.

An antibiotic mouthrinse (e.g., chlorhexidine), prior to and up to three days following procedures, may be a useful adjunct to antibiotic coverage particularly in patients with poor oral hygiene.

Furthermore, scaling and subsequent irrigation of the gingival sulcus with chlorhexidine, prior to tooth extraction and gingival flap procedures, may also be useful in reducing the risk of post-procedural complications.

5- ANTIBIOTICS AND THE TREATMENT OF POST-PROCEDURAL LOCAL INFECTION:

Available scientific evidence would suggest that HIV infection does not result in an increased risk for post-procedural complications. However, should post-procedural local wound infection occur, oral systemic antibiotics (e.g., amoxicillin, erythromycin, clindamycin, amoxicillin/clavulanic acid, or metronidazole) may be prescribed. Bacteriological culture and antibiotic sensitivity test may be needed for resistant infections. Frequent postoperative evaluation may be needed.

Signs and symptoms of postoperative infections in immunosuppressed patients may be different from those in healthy patients. Inflammation may be reduced, and there may be no purulence.

6- BLEEDING ABNORMALITIES:

Persons with AIDS may become thrombocytopenic (less than 150,000 platelets/mm³). Patients with a platelet count of 50,000/mm³ or greater rarely demonstrate any unusual postoperative complications. However, easy bruising and bleeding secondary to surgery are encountered when levels fall below 60,000 platelets/mm³. As levels fall below 20,000 platelets/mm³ spontaneous

bruising, petechias, and gastrointestinal bleeding occur.

Dental procedures, including extractions, can usually be safely performed in patients with platelet counts above 60,000 platelets/mm³ and PT/PTT no more than twice their normal values. For patients with a recent history of, or indications for, increased bleeding tendencies, periodontal/surgical procedures should be approached conservatively (i.e., tooth by tooth approach). Consideration may be given to obtaining a platelet count and/or PT/PTT prior to procedures, especially if surgical intervention is extensive and likely to result in copious bleeding. Such screening tests are also important for patients with a history of fluctuating thrombocytopenia. Screening test, when indicated, are usually conducted shortly before (i.e., 1-2days) performing procedures.

7- ANEMIA:

Anemia is common in HIV-infected individuals and arises either as a direct result of HIV infection or as a side-effect of antiretroviral therapy. It is often useful to establish a baseline value for each individual and correlate subsequent levels with the baseline.

Periodontal and minor surgical procedures (e.g., single extraction) are usually routine for patients with hemoglobin level above 7 g/dl and no bleeding abnormalities. Procedures should be approached conservatively when hemoglobin levels fall below 7g/dl; consideration should be given to the need for determining hemoglobin levels prior to procedures likely to cause bleeding. If surgical intervention is extensive and likely to result in copious bleeding, physician consultation may be necessary.

Respiratory depressing drugs (e.g., opiates) should be avoided in patients with

hemoglobin levels below 10g/dl.

8- LOCAL ANESTHESIA

Local anesthesia has not been associated with increased risk of intraoral infections. However, deep block injections can result in medical complications in patients with a recent history of, or indications for, increased bleeding tendencies. In such instances, local infiltrations or intrallgamntary injections may be warranted.

9- ENDODONTIC THERAPY

Non-surgical therapy has not been associated with a higher incidence of post-procedural complications in the HIV-infected individual. Considerations for endonotic procedures likely to result in bleeding are the same as for any other procedure likely to result in bleeding.

10- RESTORATIVE AND PROSTHETIC DENTAL CARE

There are generally no special restorative or prosthetic treatment considerations for the immunocompetent HIV-infected individual. However, as the disease advances and AIDS develops, treatment decisions (e.g., crowns versus large fillings) may be influenced by the patient's ability to attend and/or tolerate dental visits and by the patients changing medical/mental status. Restorative and prosthetic care may raise delicate aesthetic issues related to the patient's self-esteem; the dentist should be sensitive to these issues when discussing the treatment plan with the patient.

10- PREVENTIVE ORAL HYGIENE

The importance of meticulous oral hygiene should be reinforced for the HIV-infected patient and oral health established as early as possible in the disease

process. Daily brushing and flossing to remove plaque, the daily use of over-the-counter fluorides to prevent or reduce caries, and regular professional care are all important aspects of routine oral hygiene. Asymptomatic HIV-infected patients should be recalled for periodic evaluations as indicated. The Agency for Health Care Policy and Research (AHCPR) currently recommends that HIV-infected patients should be recalled at least two times per year for oral examination and evaluation; and further suggests that with the appearance of oral lesions or other complications, more frequent recall may be indicated. Decreased salivary flow as well as certain medications may increase the incidence of dental caries. Professionally prescribed fluoride supplements or topical applications may be need to be considered for such patients. The institution of daily antiseptic mouthrinses may also be considered for patients unable to maintain optimum oral health through routine preventive care.

DropBooks